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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY**

In the Matter of)

Inquiry Concerning the Deployment of)

Advanced Telecommunications)

Capability to All Americans in a Reasonable)

and Timely Fashion, and Possible Steps)

To Accelerate Such Deployment)

Pursuant to Section 706 of the)

Telecommunications Act of 1996)

CC Docket No. 98-146

**COMMENTS OF THE
PERSONAL COMMUNICATIONS INDUSTRY ASSOCIATION**

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EXECUTIVE SUMMARY

Section 706 of the Telecommunications Act of 1996 extends a principal theme of the 1996 Act – Congress’s desire to use pro-competitive, deregulatory measures to ensure that all Americans have access to telecommunications products and services – to advanced telecommunications offerings of tomorrow. In this rule making, the Commission initiates the implementation of Section 706 by responding to Congress’s directive that the agency examine whether advanced telecommunications capability is being deployed to all Americans in a “reasonable and timely fashion” and, if not, take immediate action to accelerate such deployment through the removal of barriers to infrastructure investment and other pro-competitive means.

In the attached comments, PCIA documents the current and future role of wireless technologies and services in helping to achieve the objectives of Section 706. As outlined in PCIA’s comments, wireless offerings play an essential part in fulfilling Congress’s mandate that advanced telecommunications capability be available to all Americans because wireless technologies alone provide the means to communicate and access information at anytime, from anywhere. As our society becomes increasingly more mobile, with corresponding acceleration in demand for constant access to up-to-the-minute news and information, reliance on wireless carriers, technologies, and services becomes more and more acute. Accordingly, PCIA welcomes this opportunity to identify how mobile and fixed wireless operators are currently meeting the demand for advanced telecommunications capability, how mobile and fixed wireless operators plan to meet heightened future demand, and the primary impediments to rapid deployment of advanced telecommunications capability by all wireless providers.

PCIA also takes this opportunity to posit several suggestions designed to help remove barriers to the effective introduction of wide-spread advanced wireless telecommunications capability and services. In this regard, PCIA submits that an approach similar to the deregulatory, federal framework established under Section 332 of the Communications Act of 1934, as amended, will go far in helping to ensure the removal of regulatory barriers to nationwide availability of advanced wireless offerings. Consistent with this recommendation, PCIA urges the Commission to remain mindful of the following principles as it proceeds in implementing Congress's mandate under Section 706:

- ⇒ The Commission should acknowledge the current and future role of mobile and fixed wireless operations in carrying out Congress's Section 706 mandate. Based on the critical part wireless offerings play in this regard, the Commission should define "mobility" as an advanced telecommunications capability and should recognize that a number of wireless services, including CMRS, LMDS, and private wireless operations, constitute "advanced telecommunications capability" within the meaning of Section 706.
- ⇒ The Commission should recognize that the wireless community has significant plans that will help ensure the development of an advanced telecommunications future. These include the emergence of wireless as a digital technology, the increasing penetration rates of wireless technologies in terms of the number of subscribers and geographic areas served, the suitability of spectrum below 2.5 GHz for the effective delivery of advanced telecommunications capability, the significant potential of wireless local loop offerings to become competitors in the market for local exchange services and to develop as an effective substitute for "last mile" services, and the ability of third generation mobile wireless technologies to effectuate the delivery of increasingly advanced telecommunications capabilities.
- ⇒ The Commission should endeavor to formulate its rules and policies in a way that will maximize the strengths of wireless technologies and services and help overcome barriers to effective deployment of advanced wireless telecommunications capabilities. In this connection, PCIA urges the Commission to:
 - ◆ Recognize that it has jurisdiction over mobile and fixed wireless services, including CMRS and LMDS offerings, even if it proves unnecessary to exert that jurisdiction.

- ◆ Act promptly to remove unnecessary administrative regulations, including for example, the 71 regulations identified in PCIA's July 31, 1998, *ex parte* letter, that impose costs and burdens on the wireless industry and, as a result, deter effective deployment of advanced telecommunications capability.
- ◆ Acknowledge that various additional requirements, including the CMRS resale rule, the regulations implementing the Telephone Operator Consumer Services Improvement Act, various requirements promulgated in connection with Section 214 of the Communications Act, the new rules governing the use of customer proprietary network information ("CPNI"), and the rate integration rules, are unnecessary and unwarranted as applied to carriers operating in the competitive mobile services marketplace, and eliminate such requirements expeditiously.
- ◆ Break down barriers to the effective deployment of advanced telecommunications capability by wireless operators as a result of lack of access to the sites necessary to construct wireless facilities and right-of-way fees and restrictions that discriminate against wireless carriers. In addition, the Commission should take steps to promote fair and reasonable interconnection for wireless carriers.
- ◆ Take steps to remove barriers to effective deployment of advanced telecommunications capability by wireless operators as a result of costs, in the form of direct and indirect taxes, fees, and public policy assessments, levied by federal, state, and local governmental bodies.
- ◆ Adopt coherent spectrum management policies that will promote efficient use of limited spectrum resources.

PCIA submits that, by developing an approach consistent with these general guideposts, the Commission will succeed in ensuring that wireless carriers are able to reach their full potential in helping to satisfy the goals set forth in Section 706. In addition, by fulfilling Congress's vision that advanced telecommunications capabilities and services be made available to all Americans through pro-competitive, deregulatory means, an approach based on these recommendations will guarantee that the objectives of the 1996 Act are enjoyed by Americans anywhere and by future generations.

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**COMMENTS OF THE
PERSONAL COMMUNICATIONS INDUSTRY ASSOCIATION**

The Personal Communications Industry Association ("PCIA")¹ hereby submits these comments in response to the Notice of Inquiry ("NOI") adopted by the Commission on August 6, 1998, in the above-captioned proceeding.² The NOI is one of two companion initiatives aimed at promoting marketplace conditions conducive to the nationwide deployment of advanced

¹ PCIA is an international trade association established to represent the interests of both the commercial and private mobile radio service communications industries and the fixed broadband wireless industry. PCIA's Federation of Councils includes: the Paging and Messaging Alliance, the Broadband PCS Alliance, the Site Owners and Managers Association, the Association of Wireless Communications Engineers and Technicians, the Private Systems Users Alliance, the Mobile Wireless Communications Alliance, and the Wireless Broadband Alliance. As the FCC-appointed frequency coordinator for the 450-512 MHz bands in the Business Radio Service, the 800 MHz and 900 MHz Business Pools, the 800 MHz General Category frequencies for Business Eligibles and conventional SMR systems, and the 929 MHz paging frequencies, PCIA represents and serves the interests of tens of thousands of FCC licensees.

² *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, FCC 98-187 (rel. Aug. 7, 1998) (Notice of Inquiry) ("NOI").

telecommunications services by all service providers, as directed by Section 706 of the Telecommunications Act of 1996.³

Through the submission of these comments, PCIA responds to the Commission's request for information concerning the ability and incentives of wireless carriers to deploy advanced telecommunications capability. In addition, PCIA addresses the Commission's request for comment concerning the existence of regulatory barriers that impede greater use of wireless spectrum for advanced services.

As outlined below, wireless technologies play a critical role in ensuring that the advanced telecommunications needs of the American public are capable of being satisfied anytime, anywhere. In recent years, Americans have become increasingly mobile, and their demand for constant access to communications services and information has spiraled. Given this trend and in view of Congress's mandate under Section 706, it is crucial that the Commission recognize and promote the unique capacity of wireless technologies and services to provide consumers and business users seamless and universal advanced telecommunications capability.

I. INTRODUCTION AND SUMMARY

Section 706 directs the Commission and state commissions with jurisdiction over telecommunications services to foster "the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans . . ."⁴ The statute lists "price cap

³ See Pub.L. 104-104, title VII, § 706, Feb. 8, 1996, 110 Stat. 153, reproduced in the notes under 47 U.S.C. § 157. See also *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, FCC 98-188 (rel. Aug. 7, 1998) (Notice of Proposed Rulemaking) (combining dockets: CC Docket Nos. 98-147, 98-11, 98-26, 98-32, 98-78, and CCB/CPO No. 98-15, RM 9244).

⁴ 47 U.S.C. § 157 note.

regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment” as means for accomplishing this goal.⁵ Section 706 mandates that, within 30 months after the date of enactment of the 1996 Act, the Commission initiate a notice of inquiry exploring the availability of advanced telecommunications capability to all Americans, including elementary and secondary schools and classrooms. If the Commission finds that advanced telecommunications capability is not being deployed in a reasonable and timely fashion, the agency must “take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”⁶

The Commission adopted the instant *NOI* to initiate its inquiry under Section 706. In the *NOI*, the Commission seeks comment on a broad range of questions designed to permit an assessment of the extent to which the mandate of Section 706 is being met. To this end, the *NOI* asks commenters to discuss: (1) which facilities and services fall within the definition of “advanced telecommunications capability;” (2) the extent to which various industry segments currently offer or have plans in the future to provide advanced telecommunications capability; (3) the demand for advanced telecommunications capability and services; and (4) how the Commission should apply the techniques identified by Congress – or other methods – to aid the deployment of advanced telecommunications capability.

⁵ *Id.*

⁶ *Id.*

By adopting Section 706, Congress sought to facilitate the expeditious provision of advanced telecommunications capability, on a nationwide basis, through the use of pro-competitive, deregulatory measures. Through the implementation of a similar mandate – Section 332(c) of the Act – the wireless industry has successfully carried out Congress’s vision that the advanced telecommunications capability of “mobility” be made available to American consumers on a nationwide basis. The success of the wireless industry in fulfilling the objectives undergirding Section 332 is instructive to the instant inquiry in two separate respects.

First, wireless technologies, in both mobile and fixed applications, constitute “advanced telecommunications capability” and, through that capability, enable wireless carriers to provide “advanced services.” In particular, the ability to originate and receive advanced telecommunications services anywhere, at anytime, is critical to realizing the benefits of such services to American citizens. Through a suite of offerings that are increasingly digital, intelligent, and broadband, wireless carriers are uniquely able and motivated to ensure that members of the American public have access to advanced telecommunications capabilities and services, regardless of whether they are at work, at home, at play, or in transit. In addition, in a growing number of residential areas, wireless services are being marketed as an alternative to wireline telephone service that offers the added advantage of greater available bandwidth for data transmissions, including Internet access. In this respect and because they offer an inexpensive means for facilitating the delivery of advanced telecommunications capabilities to remote and underserved areas, wireless technologies provide an effective solution to the “last mile” problem. Likewise, wireless services are uniquely situated to meet the advanced telecommunications needs of schools and libraries because they side-step high installation costs typically associated with wire-based alternatives.

Second, the deregulatory, federal framework established under Section 332 helped ensure the removal of regulatory barriers to the development of a nationwide, mobile communications network. Consistent with the mandate of Section 706, similar policies should be used to eliminate barriers to competition and infrastructure investment in the wireless component of advanced telecommunications capability and services. To help ensure this result, PCIA suggests that the Commission develop an approach based on the following principles:

- ◆ Regardless of how the market for advanced telecommunications capability ultimately evolves, the Commission should recognize that different barriers, regulatory or otherwise, exist for different industry segments. Rather than deciding whether one regulatory model is appropriate for the provision of advanced telecommunications capability and services by all providers, the Commission's policies should acknowledge and address the impediments and competitive characteristics unique to each participating market sector.
- ◆ The policies and regulatory models applicable to wireless carriers should be tailored to the competitive nature of facilities-based wireless services; participants in the robustly competitive wireless marketplace should not be subject to regulatory requirements used to govern less competitive industry segments, such as the local exchange market.
- ◆ The Commission should focus on eliminating impediments to full construction of facilities-based wireless networks, and should avoid the imposition of regulatory requirements derived from a monopoly-based environment. Similarly, the Commission should not extend outdated regulatory strictures to new competitors in the name of regulatory parity. Instead, it should focus on the implementation of forward-looking policies that facilitate investment in and deployment of new competitors' fixed and mobile wireless infrastructure. As incumbent carriers become true competitors in their own and other markets, the same deregulatory models should be extended to them.

II. ADVANCED TELECOMMUNICATIONS CAPABILITY INCLUDES WIRELESS TECHNOLOGIES AND SERVICES

"Advanced telecommunications capability" is defined in Section 706 "without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality

voice, data, graphics, and video telecommunications using any technology.” As outlined below, a number of currently available wireless technologies and services – including both mobile and fixed wireless applications – constitute “advanced telecommunications capability” within the meaning of Section 706.

Mobility. By permitting American consumers to send and receive advanced telecommunications anytime, anywhere, the mobility offered through the use of wireless technologies and services is an advanced telecommunications capability. Since 1993, the United States has witnessed an explosion in the use of mobile telecommunications devices. Subscribership in the mobile telephone market alone has grown from 16.01 million in December of 1993 to 55.31 million in December of 1997,⁷ and sources predict that, by 2002, there will be over 900 million wireless subscribers worldwide.⁸ Americans today expect and demand constant connectivity throughout a broad array of coverage areas, ranging from within buildings and workplace campuses to seamless nationwide networks. Wireless offerings permit Americans on the move to retain ubiquitous contact with family members and co-workers, and ensure constant access to mission critical data, e-mail accounts, and other essential information.

Although mobility has already become a way of life for most citizens, its importance is expected to grow exponentially as the provision of advanced

⁷ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, FCC 98-91, at 14 and Figure 3 (rel. June 11, 1998) (Third Report) (“*Third Annual CMRS Competition Report*”).

⁸ See Perry LaForge, *Will Wireless Do It All? cdmaOne Provides a Robust Platform for Multi-media*, Advanstar Communications, Inc., Americas Network, June 1, 1998.

telecommunications services multiplies. This phenomenon has already occurred in at least one respect: the increasing importance of computers and the Internet in American society has produced a corresponding increase in consumer demand for “anytime/anywhere” mobile access to data, information, and computer capabilities. Wireless technologies and services offer unparalleled ability to address the needs of the mobile computing market by permitting consumers and workers access to information through easy-to-use, convenient devices, from virtually anywhere.⁹

CMRS Offerings. A number of commercial mobile radio service (“CMRS”) operators currently offer services that constitute “advanced telecommunications capability” within the meaning of Section 706. Most fundamentally, CMRS spectrum is already being used to provide high-quality voice and data capabilities to consumers. For example, new personal communications service (“PCS”) systems have been constructed as fully digital networks that provide high-quality digital voice, voice mail, and e-mail messaging services as part of their routinely available product line, through a single, lightweight handset.

In addition, a growing number of PCS carriers have begun to offer Internet access capabilities, as do an increasing number of cellular operators using cellular digital packet data (“CDPD”) technology. As traditional cellular carriers continue the conversion of their networks from analog to digital, more advanced services will become available through

⁹ The *NOI* asks whether advanced telecommunications capability using mobile or fixed technology should be distinguished. *NOI*, ¶ 13. For definitional purposes, the answer is no. Because Section 706 specifically indicates that advanced telecommunications capability is to be considered “without regard to any transmission media or technology,” drawing distinctions based on whether an application is mobile or fixed would be inappropriate. As noted elsewhere in these comments, however, the unique regulatory regime created for the competitive facilities-based wireless marketplace merits distinctions in terms of how to foster the development of advanced wireless technologies.

that medium. Similarly, various other CMRS operators, including a number of paging companies,¹⁰ offer e-mail and Internet-based information delivery services that essentially transform wallet and palm-sized wireless devices into miniature network computers. Wireless modem cards used in conjunction with CMRS networks also enable consumers and workers to enjoy cost-effective, wireless access to corporate networks and the Internet through the use of hand-held wireless products.¹¹

Fixed Wireless Offerings. Fixed wireless technologies and services also fall within the definition of “advanced telecommunications capability.” Fixed wireless technology can be offered on a primary basis, as is the case with high bandwidth Local Multipoint

¹⁰ PCIA is mindful of the fact that the statutory definition of “advanced telecommunications capability” makes specific reference to “broadband” capability, and that paging services have been characterized by the Commission as narrowband rather than broadband. Nevertheless, today’s state of the art, one-way messaging services are indeed “advanced” as that term is commonly understood, and are evolving rapidly in terms of speed of information delivery, capability, functionality, and so forth. The evolution of these services is directly relevant to this general inquiry into the state of the telecommunications marketplace. In this same connection, PCIA underscores that the implications of this proceeding and the Commission’s companion Notice of Proposed Rule Making are significant for the wireline and wireless industries. PCIA is concerned that the effort of the Commission to promote advanced telecommunications capabilities, particularly by incumbent LECs, will shift attention away from the continuing need to ensure that the core pro-competitive provisions of Sections 251 and 252 of the Act are implemented and rigorously enforced. Because of this concern, PCIA will be submitting comments in response to the companion Notice of Proposed Rule Making proposing methods by which the Commission can foster the dual objectives of opening the local loop and promoting wide-spread advanced telecommunications capabilities.

¹¹ The *NOI* asks whether the fact that a telecommunications technology is “one-way” in nature or does not provide a “real-time” connection should affect the categorization of a telecommunications capability as “advanced.” The answer is no. Because the statutory definition refers to the capability “without regard to any transmission media or technology,” distinctions based on directionality or timing should not be drawn. In addition, the reference in the definition to the ability to “originate and receive” should be interpreted inclusively. Thus, a technology may be deemed advanced if it allows a user to originate, and a technology may be advanced if allows one user to receive. There should be no inferred requirement that a technology must allow both functionalities to be included, just as the use in the definition of the term “and” in reference to voice, data, graphics and video, should not be construed to require a technology to deliver all of these capabilities to be deemed advanced.

Distribution Service (“LMDS”) offerings, or on an ancillary-to-mobile basis. Provided either way, these services constitute high-speed, switched, broadband telecommunications capability that allows users to originate and receive high-quality voice, data, graphics, and video telecommunications.

LMDS is a fixed broadband point-to-point microwave service assigned a total of 1,300 megahertz of spectrum in the 27.5-28.35, 29.1-29.25, and 31 GHz frequency bands. LMDS licensees are capable of providing subscribers a variety of one and two-way broadband services, including video programming, video teleconferencing, wireless local loop telephony, and high-speed data transmission, such as Internet access. Because of this broad range of potential applications, LMDS is well situated to become a major competitor to local exchange and cable television offerings.

Although LMDS is still in the early stages of development, at least one LMDS operator is currently providing competitive video distribution and Internet services and has announced plans to offer wireless local loop service in the near future.¹² The Commission completed the auction of LMDS spectrum last winter and has recently announced the conditional grant of numerous LMDS applications. Auction winners are expected to begin offering commercial service within a two-year time-frame. Analysts predict that, at least initially, LMDS operators will focus on the provision of wireless voice and data services, especially wireless Internet access, to business customers and residential customers in multiple dwelling units. Capabilities for the offering of similar advanced services on a

¹² That licensee, CellularVision USA Inc., is currently providing service in the New York City area.

primary, fixed wireless basis also exist in the 39 GHz band. At least two operators in that band are currently providing service, with broader roll-out scheduled to begin shortly.¹³

In the *CMRS Flex* proceeding, the Commission amended its rules to allow certain mobile radio service licensees “greater flexibility” to offer all types of fixed, mobile, and hybrid services on their assigned spectrum.¹⁴ The specific rule changes permit providers of narrowband and broadband PCS, cellular, certain SMR, paging, 220-222 MHz, and for-profit interconnected Business Radio services to offer fixed wireless services on a co-primary basis with their mobile offerings.¹⁵ The Commission adopted the *CMRS Flex* decision in order to promote the development of wireless local loop services as well as to “stimulate wireless competition in the local exchange market, encourage innovation and experimentation in development of wireless services, and lead to a greater variety of service offerings to consumers.”¹⁶ Although several cellular and broadband PCS

¹³ The 39 GHz band includes the frequencies at 38.6-40.0 GHz. The FCC recently amended its rules to implement licensing on the basis of Basic Trading Areas (“BTAs”) on these frequencies and adopted competitive bidding procedures for the issuance of future licenses. In accordance with the rule changes implemented by the Commission, licensees in the 39 GHz band may offer a variety of services, including point-to-point, point-to-multipoint, and eventually, mobile operations. WinStar, an incumbent licensee operating in this spectrum, currently offers a package of local and long distance telephone, data, and Internet services in 24 major markets. ART, the second largest holder of 39 GHz licenses, currently focuses on the provision of last mile connectivity between end users and telecommunications providers. ART plans to market broadband point-to-point voice, data, and video service beginning the fourth quarter of 1998.

¹⁴ *Amendment of the Commission's Rules To Permit Flexible Service Offerings in the Commercial Mobile Radio Services*, 11 FCC Rcd 8965 (1996) (First Report and Order and Further Notice of Proposed Rule Making) (“*CMRS Flex First Report and Order and Further Notice*”).

¹⁵ *Id.*, at 8976. Licensees on this spectrum classified as “commercial mobile radio service” as opposed to “private mobile radio service” operators may offer fixed, mobile, and hybrid services. *Id.*

¹⁶ *Id.*, at 8967.

companies have expressed an interest in providing fixed wireless services, these offerings are still in the early stages of development.

Fixed wireless services, whether provided by fixed or mobile radio licensees, offer several significant capabilities in addition to permitting the transmission and receipt of services that fall within the purview of Section 706. In particular, fixed wireless offerings have the potential to serve as “backbone” telephone service facilities, offer an effective solution to the bandwidth limitations of the “last mile” facilities of many incumbent LECs, and constitute potential competitors to traditional local exchange carriers. In addition to offering greater available bandwidth than wireline services, fixed wireless services provide entities seeking to compete against traditional local exchange carriers the advantages of reduced network deployment costs, speed to the market, low maintenance costs, and the potential for wireline-wireless integration. Recognizing these advantages, many local exchange carriers also view fixed wireless services as a cost-effective means for extending service to dense or difficult to reach urban areas or facilitating last-mile access to rural customers.

Private Wireless Services. Many Americans may also receive advanced telecommunications capability and services through private wireless systems regulated under Part 90 of the FCC’s rules. Currently, private wireless systems provide communications service to over 10 million users from interest groups as diverse as small businesses, railroads, taxicabs, utilities, forestry industries, and fish and wildlife agencies. A number of private wireless users look toward the future of advanced telecommunications to supply them with applications such as mobile transmission of text and images, database input and retrieval, and video transmission. While proliferation of such private networks will advance the goals of Section 706, current

Commission regulatory and spectrum management policies have hampered effective development of private systems.

Most private wireless systems were constructed to meet the internal needs of licensees unable to obtain service with the necessary parameters and features from commercial operators either at all, or at a reasonable price. Indeed, many private wireless systems have advanced the state-of-the-art because their specialized needs demanded customized solutions.¹⁷ Generally, however, these systems are tailored to address the unique coverage and service requirements of individual users and, as such, are ill-equipped to meet the needs of the general public.¹⁸ Nonetheless, Commission support for the development of advanced private networks will provide another option for Americans seeking access to advanced telecommunications capabilities.

The deployment of advanced private systems – as well as traditional private dispatch stations – has been severely hindered by spectrum congestion and the absence of new spectrum. The predominant environment in which private wireless systems operate is essentially narrowband, with channel sizes no greater than 25 kHz. In fact, most of the spectrum available for private wireless users is now subject to “refarming,” which requires additional capacity to be generated through further narrowbanding. To help overcome the problems associated with spectrum shortages and assist in accommodating the private wireless community’s need for

¹⁷ For example, the Ardis data radio network was originally developed as the private nationwide data network for IBM, Inc.

¹⁸ Moreover, use and eligibility restrictions contained in the Commission’s rules generally prohibit the offering of commercial service to the public on private wireless systems. On the other hand, private wireless users have a long history of sharing among like users. PCIA urges the Commission actively to support such shared use systems in accordance with Section 90.179 of the Rules.

advanced telecommunications capabilities, PCIA urges the Commission to adopt the recommendations contained in the Petition for Rule Making filed recently by the Land Mobile Communications Council ("LMCC").¹⁹ As outlined in the LMCC Petition, new spectrum allocations for private wireless users are urgently needed to alleviate congestion in existing bands and provide some "green space" for the development and implementation of new advanced technologies.²⁰

III. WIRELESS PLANS FOR AN ADVANCED TELECOMMUNICATIONS FUTURE

A. The Emergence of Wireless as a Digital Technology Will Further Enhance the Role of Wireless Technologies and Services in Fulfilling Congress's Mandate Under Section 706

An increasing number of wireless networks are shifting from analog to digital technology, largely to increase system capacity and allow transmission of more types of information.²¹ Within the same bandwidth, the capacity gains brought about through the use of digital technology also permit wireless systems to serve significantly more subscribers than the number served using analog technology.

¹⁹ Land Mobile Communications Council's Petition for Rule Making, RM-9267 (filed Apr. 22, 1998).

²⁰ At times, the Commission has challenged its support for private wireless systems and has furthered its belief that commercial systems will evolve to provide private users with traditional and advanced communications services. While many traditional private users have migrated to CMRS systems, PCIA disagrees with the assumption that carrier networks will be able to adapt to all specialized needs. For example, the *NOI* notes that some potential suppliers of advanced telecommunications capability use asymmetric architecture, which "usually entails high speeds downstream (from the advanced service provider to the end user) and slow speeds upstream." *NOI*, ¶ 75. It is highly probable that private system applications will require the opposite capabilities. Further, common carrier obligations often prevent commercial providers from being able to tailor their offerings to a single specialized customer.

²¹ *Third Annual CMRS Competition Report*, at 5.

Conversion to digital modulation techniques will help ensure that wireless technologies are able to provide advanced telecommunications capabilities and services with the ease and high speed that consumers demand. Digital signaling, and the corresponding change from hardware-driven to software-based intelligence, will increase wireless capabilities significantly. Advanced digital modulation techniques also offer information compression capabilities that make provision of advanced services more likely. Higher-level modulation systems require robust and more complex compression algorithms in order to pass the same information through the network in a more compact format.²² This, in turn, requires an increase in the processor power to encode and decode these compression algorithms.²³ The combination of higher level modulation techniques and increases in processor power dictates that additional capabilities will be possible for CMRS devices because higher level modulation schemes decrease bandwidth occupancy per communication, allowing excess capacity formerly needed for the individual communication to be used for additional communications.²⁴ In addition, advanced services not even contemplated today will become commonplace as processor power advances. This trend is already apparent, as evidenced by the steady introduction of new digital CMRS products capable of delivering additional services at reduced costs and in increasingly smaller subscriber units.

Because the delivery of video via CMRS spectrum still presents capacity issues, video CMRS offerings are as yet unavailable for consumer or internal private use. However, the continuous introduction of additional, higher level data compression schemes and increased

²² See, e.g., Theodore S. Rappaport, *Wireless Communications: Principles and Practice*, at 220-23 (1996).

²³ *Id.*

²⁴ *Id.*

processor power is expected to bring about significant changes. Enhancements to digital wireless systems should also enable the seamless delivery of video services for use in such applications as video conferencing. In addition, these enhancements should allow CMRS users to browse the Internet and access e-mail at data rates much faster than those available on existing CMRS systems.²⁵

The Internet, in fact, is a model for future communications because it has developed through the use of the Internet protocol ("IP"). The IP uses packets to move all data (including messages, voice, and video) through a network in a compressed, highly efficient manner. In comparison, traditional wired and wireless networks are based primarily on circuit-switched techniques, with the voice or data channel being monopolized by the communications, even if no information is being transmitted. Packet networks enable more efficient delivery of information because they allow fragmentation,²⁶ traffic prioritization,²⁷ and source routing,²⁸ among other features.²⁹

²⁵ For example, CDPD operates with a maximum data rate of 19,200 bps but with an actual throughput rate of 9,600 bps. *See Frost and Sullivan's Report #5268, U.S. Cellular Service Markets*. PCS companies that offer wireless data using the GSM 1900 standard are also providing data at a throughput rate of 9,600 bps. *See, e.g.,* Omnipoint service information available at its World Wide Web site <<http://www.omnipoint.com>>.

²⁶ Fragmentation is the ability to split (or fragment) packets into smaller packets. This permits the data contained in a large packet to travel across a network capable of handling only smaller packets. IP fragments and reassembles packets transparently.

²⁷ IP supports traffic prioritization by allowing packets to be labeled with an abstract type of service.

²⁸ IP provides several optional features, one of which is source routing. Source routing allows a packet's sender to set requirements on the path it takes through the network.

²⁹ Although CDPD currently offers packet data capabilities, it is based on the existing analog standard. Through the existing system, CDPD users obtain a dedicated channel for their use alone or share channels with the voice network. In either case, voice communications have a priority
(Continued...)

CMRS providers are studying and improving upon IP and packet-based technology and modifying the protocol to better match the needs and requirements of wireless networks. Once wireless networks are fully configured to be digitally packet-based, the resultant efficiencies will permit the delivery of additional advanced capabilities and services, including video and full Internet connectivity.

B. Declining Prices in the Wireless Marketplace Are Making Wireless Offerings Accessible to More and More Consumers, Increasing the Significance of Wireless as a Medium for the Delivery of Advanced Telecommunications Capability to All Americans

In recent years, wireless carriers have achieved unprecedented growth in terms of both geographic coverage and numbers of subscribers. As noted in the *Third Annual CMRS Competition Report*, approximately 273 Basic Trading Areas (“BTAs”), containing over 219 million POPs, now have three or more mobile telephone operators offering service.³⁰ This represents over 87 percent of the nation’s total POPs.³¹ Wireless subscribership has witnessed corresponding increases, with reports indicating that, as of December 1997, the mobile telephone market had over 55 million subscribers.³² Meanwhile, the paging industry reportedly added over seven million new paging units in 1997 alone, producing an estimated total of 49.8 million paging units.³³

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over CDPD applications and, if no channels are available, a CDPD user could be dropped by the system while communicating.

³⁰ *Third Annual CMRS Competition Report*, at 18.

³¹ *Id.*

³² *Id.*, at 14.

³³ *Id.*, at 39.

The growing acceptance and use of wireless products is attributed to the increased emphasis on mobility and the declining price of wireless services.³⁴ Due to the interplay of these forces, wireless offerings are no longer viewed as a luxury or solely for emergency purposes; they are, instead, a necessity that, thanks to the steady introduction of new competitors, has become increasingly more affordable and increasingly more usable by an expanding number of consumers.

In this environment, it is essential that competing wireless carriers concentrate on making innovative features available in order to survive. As wireless carriers seek to distinguish themselves in the market, the provision of an increasing array of advanced services is expected to become commonplace. The market potential for expansion of advanced wireless services is enormous. Analysts estimate the potential market for wireless e-mail and Internet applications at 44.3 million and 39.6 million subscribers, respectively.³⁵ In addition, analysts forecast that by 2001, there will be approximately “11 million wireless e-mail users and 1.6 million wireless Internet subscribers using dedicated data, cellular and broadband PCS, and paging services.”³⁶

³⁴ See *id.*, at 15 (reporting that the average monthly bill in the wireless telephone market has continued to decline, reflecting a trend of increasing penetration in market sectors with lower usage and consequently, lower monthly bills). The decline in wireless telephone prices is also attributed in part to the entry of new market participants. *Id.*, at 19-20. Recent reports indicate that prices in North America for the average user of mobile cellular and PCS services dropped 16 percent during 1997 alone, while in the largest markets, New York and Los Angeles, competition led to declines of 63 percent and 64 percent, respectively. See Fred Dawson, *PCS Cos. Eye Fixed Wireless High-Speed Data Services*, Multichannel News, May 4, 1998, at 212, 214 (citing a study performed by The Yankee Group).

³⁵ See *Third Annual CMRS Competition Report*, at 62 (citing The U.S. Mobile Data Marketplace: 1997, The Strategis Group, at 210-13 (1997)).

³⁶ *Id.*

C. Spectrum Below 2.5 GHz Is Uniquely Situated for Effective Deployment of Advanced Telecommunications Capability and Services

In the *NOI*, the Commission asks commenters to discuss “the potential for advanced telecommunications capability to be deployed on spectrum below 2.5 GHz.”³⁷ The Commission requests comment in particular on “the potential for that spectrum to be a substitute for wireline last miles.”³⁸ As discussed above, a number of CMRS operators – all located on spectrum below 2.5 GHz³⁹ – are already providing capabilities and services that fall within the definition of “advanced telecommunications capability.” Moreover, the Commission’s recent rule changes permitting CMRS licensees to offer fixed and hybrid services on their licensed spectrum present significant opportunities for increased competition in the provision of all telecommunications services and allow CMRS providers to address the advanced telecommunications demands of consumers more effectively.

In addition, the *Balanced Budget Act of 1997*⁴⁰ identified several bands of federally-held spectrum below 2.5 GHz to be reallocated through competitive bidding for private sector use.⁴¹ These bands, in conjunction with the CMRS bands, provide an excellent opportunity for the delivery of advanced telecommunications capability and services. In fact, in recommending this

³⁷ *NOI*, ¶ 50.

³⁸ *Id.*

³⁹ The service providers referred to in the *NOI* as CMRS providers all operate on spectrum below 2.5 GHz. In particular, broadband PCS uses frequencies in the 1850-1990 MHz band, the cellular service is located in the 800 MHz band, the SMR service is located in the 800 MHz and 900 MHz bands, and CMRS paging operations are located primarily in the 900 MHz band.

⁴⁰ See *Balanced Budget Act of 1997*, Pub. L. No. 105-33, § 3005, 1997 U.S.C.C.A.N. (111 Stat.) 251.

⁴¹ The specific spectrum identified are the bands from 139-140.5 MHz and 141.5-143 MHz, 216-220 MHz, 1.385-1.39 GHz, 1.432-1.435 GHz, and 2.385-2.39 GHz.

spectrum, the National Telecommunications and Information Administration (“NTIA”) stressed its potential use for new fixed and mobile commercial and consumer applications, such as wireless local loop. PCIA notes, however, that the deployment of advanced wireless systems typically requires access to wide blocks of contiguous spectrum, whereas most of the spectrum blocks slated for transfer from federal government use are modest in size, at best. The Commission and NTIA must, therefore, remain vigilant to identify and clear wider bands of contiguous spectrum.

Spectrum bands below 3 GHz have outstanding physical characteristics suitable for the provision of mobile and fixed services. These bands do not suffer from significant rain attenuation effects nor do they have substantial difficulty with building penetration, permitting seamless coverage and service to consumers. In addition, these bands are capable of 6 to 10 mile radii of operations, making them exceptional candidates for the provision of mobile and fixed services to a broad range of consumers without excessive costs.

D. Fixed Wireless Local Loop Offerings Have the Potential To Be Significant Competitors in the Market for Local Exchange Services and To Provide an Effective Substitute for “Last Mile” Services

Under a favorable, federally-based regulatory scheme, fixed wireless technologies have significant potential to bring meaningful competition to the local exchange marketplace. In addition, if free from unnecessary or burdensome state regulations, fixed wireless services offer a quick and inexpensive means for by-passing existing wireline infrastructure to provide first-and last-mile connectivity

As discussed in Section II above, wireless local loop services offer a strong list of advantages, including cost-effective deployment, rapid delivery of new services, easy installation regardless of rugged terrain or remoteness, and low maintenance costs. On a per line basis, the